## MEXICAN GRASSES.

BY F. LAMSON-SCRIBNER.

### I. *Species Collected in* 1890, *by Mr. C. G. Pringle.*

1. (**3447**). **Tripsacum fasciculatum** Trin., Aschers. in Bot. Zeit. 1877, p. 525; Fourn. Mex., Pl. Enum. Gram., p. 69.

Ledges, San José Pass, fifty miles northeast of San Luis Potosi. August 15.

2. (**3135**). **Erianthus saccharoides** Mx., var. **Trinii** Hack. in Mart. et Eichl. Flor. Bras. II, Pars 3, p. 258.

Nodes with a ring of short appressed hairs, pruinose or shining below. Panicle about 30 cm. long, its base (in our specimen) included in the uppermost leaf-sheath, the blade of which is very narrow and about 10 cm. long. Pedicels about $\frac{2}{3}$ as long as the spikelets, thickened above, long pilose. Sessile spikelet 6 mm. long, outer glume shortly bimucronate; first glume 2-keeled, scabrous on the keels above, 4-nerved, pilose on the back; second glume scabrous on the keel near the apex and with a few long hairs on the back below, 5-nerved, ciliate on the inflexed, hyaline margins; fourth glume lanceolate, ciliate on the margins above, two-toothed; awn about 9 mm. long. Anthers 1·5–1·8 mm. long, falling from the spikelets. Styles as long as the stigmas which are exserted at maturity.

The dull white color and length of the panicle, its base enclosed in the sheath of the uppermost leaf, the hairs upon the outer glumes, the hyaline and ciliate inflexed margins of the second glume, and the ciliate margins of the fourth, all point to *Erianthus Trinii* Hack. (Monog. Androp., p. 135), but the exserted styles and length of the anthers—characters used to separate *E. Trinii* from *E. saccharoides* by Hackel—point to the last named species. These characters are doubtless variable and do not deserve to have so much value attached to them. After having made a very careful study of the material in my herbarium in connection with the descriptions given by Hackel (Monog., pp. 129, 135) of *E. saccharoides* and *E. Trinii*, I fail to find any valid character among those given to define these species, which is not broken down or lost in the descriptions given of the several varieties or subspecies enumerated. I have, therefore, preferred to regard it as only a variety. *E. saccharoides* var. *contortus* (made a subspecies by Hackel) has, I think, better or stronger claims to rank as a species than has *E. Trinii*.

Mountain sides, Tamasopo Cañon. June 24.

3. (**3132**). **Rottbœllia compressa,** Linn. fil. Suppl., p. 114, var. **fasciculata**; Hack. Monog. Androp., p. 286. *Hemarthria fasciculata* Kunth. Revis. Gram. I, p. 152; Fourn. Mex. Pl. Enum., Gram., p. 67; Vasey Contr. U. S. Nat. Herb. II, p. 53.

About ledges of a cascade at the head of Tamasopo Cañon in the mountains midway between San Luis Potosi and Tampico. June 24.

4. (**3134**). **Andropogon condensatus** Kunth, in HBK. Nov. Gen. I, p. 188, var. **paniculatus** Hack. in Mart. et Eichl. Fl. Bras., Vol. II, pars 3, p. 297; Monog. Androp., p. 388. *A. paniculatus* Kth., *A. Lhotzkyi* Steud.; Fourn., Pl. Mex. Enum., Gram., p. 61.

On exposed, cool ledges of mountain sides above Tamasopo Cañon. June 24.

5. (**3446**). **Andropogon macrourus** Michx., var. **corymbosus** Hack. Monog. Androp., p. 409.

Exposed slopes, Tamasopo Cañon. June 24.

6. (**3128**). **Hilaria cenchroides** HBK., var. **ciliatus** var. nov.

Culms slender, 35 cm. high; spikes slender, about 3 cm. long. Groups of spikelets 4–5 mm. long, pale green. Awns short, not extending beyond the lobes of the glumes, and conspicuously ciliate along their sides with short spreading or deflexed hairs. There are usually two awns between the lobes of the outer glumes of the ♀ spikelet.

Near Guadalajara. May 17.

The genus *Hilaria* may be briefly characterized as follows:— Spikelets sessile in groups of three at each joint of the zigzag continuous rachis, forming terminal spikes, the groups falling off entire. The two outer or anterior spikelets ♂ and two- to three-flowered; the posterior or inner one (next the rachis) ♀ or ☿ and one-flowered. Empty glumes much firmer in texture than the others, inequilateral, many nerved, more or less connate below, entire at apex or more often divided, usually unequally two-lobed, with one to several intermediate awns or awn-like divisions.

*Hilaria cenchroides* is a low, stoloniferous grass and presents considerable variation in the length and breadth of its leaves, and especially in the size of the spikelets, breadth of glumes and their divisions, length of awns, etc. In some forms the outer glumes are pale green with roseate, scarious tips, while in others these glumes are more or less thickly covered with dark purple, punctate dots.

E. Palmer's specimens (No. 197, coll. 1886) are nearly typical, very closely resembling the illustration in HBK. Nov. Gen. et Sp. I, t. 37. Pringle's specimens of 1885 (No. 493) differ but little from

this. Palmer's No. 347 (1887) is less markedly stoloniferous, taller and more slender throughout with longer leaves. It is essentially the same form as that named by Dr. Vasey, *H. cenchroides* var. *Texana* (Grasses of the Southwest, Part. I, Pl. X). In the figure of this last, the outer glumes of the spikelets are represented as scabrous, as they certainly are in my specimens, although in the descriptions they are said to be "smooth."

In Pringle's No. 3128 the spikelets are decidedly shorter than in any other form I have seen, as are also the awns, and these are remarkable in that they are ciliate along their edges (see fig. 2a, Plate XIII.)

In Mexico, *H. cenchroides* is used in decoction as a popular remedy to purify the blood especially in cases of skin disease. (Bull. Torr. Bot. Club, XIV, p. 100).

7. (**3133**). **Arundinella Deppeana** Nees in Bonplandia, 1855, p. 84. Steud. Syn. Gram., p. 115; Fourn. Mex., Pl. Enum., Gram., p. 54. Same as 1552 C. Wright, Cuban collection (*A. Cubensis* Griseb. Pl. Wr., p. 533). No. 2615 Pringle, 1889, is the same.
Hemsley (Biol. Contr. Am. Bot. III, p. 252) unites *A. Auletica* Rupr. and *A. latifolia* and *A. scop ria* Fourn. with *A. Deppeana*.

First glume about as long as the third (2·2–2·5 mm.) acuminate-pointed, scabrous on the keel above, 3-nerved; third glume 3·5–3·8 mm. long, 5-nerved below, drawn out to a narrow and truncate or emarginate apex; fourth glume about 1·8 mm. long (including the obtuse and hairy callus). Awn very slender, about 9 mm. long, not flattened nor twisted below, once geniculate, bending at a point about 2 mm. above the glume (ch. ex. spec. Pringle).

About the ledges of a cascade at the head of Tamasopo Cañon in the mountains midway between San Luis Potosi and Tampico. June 24.

I refer Pringle's No. 3133 to *A. Deppeana* from the characters given by Fournier (l. c.) which it may be well to reproduce here. "Culmo gracili, 3-pedali, foliis angustis, glaucis sæpe convolutis, summo a panicula remoto, glabris cum vaginis, ligula truncata, pilosa; pedicellis nudis, paniculæ laxæ radiis patulis infra remote verticillatis, supra sparsis raris; gluma superiore caudata inferiorem superante, aristæ genu nunquam attingente, arista gracili, æqua, glumam superiorem plus quam duplam æquanti, post maturum florem refracta flexuosa."

In Plant. Cubensium, Grisebach reduces *A. Cubensis* to *A. Brasiliensis* Raddi, probably on account of the opinion expressed by Munro

in regard to it. According to Trinius' figure (Icon. Gram. tab., 266) of *A. Brasiliensis*, as well as the descriptions given of this species, I must consider Pringle's plant distinct from it. *A. Brasiliensis* is a stouter grass with broader leaves, and the awns of the spikelets are much shorter, stouter, strongly flattened and twisted below the geniculation, similar to that shown in Plate XIII, figs. 9b and 9c, drawn from a spikelet of No. 1746 Pringle, 1888.

**8.** (**3129**). **Paspalum conjugatum** Berg., Act. Helv. VII, p. 129, Pl. 8; Trin. Icon. tab. 102; Chapm. So. Flor. Suppl., p. 666; Vasey in Bull. Torr. Bot. Club, XIII, p. 163.

By streams at Las Canoas in the valley at the head of Tamasopo Cañon. July 8.

**9.** (**3343**). **Paspalum gracile** Rudge?, Fourn. Mex. Pl. Enum., Gram., p. 5.

Culms erect or ascending from a geniculate or subrepent base, branched below, 20–35 cm. high. Leaves narrowly to broadly lanceolate (3–8 cm. long by 1–1·5 cm. broad) acute, cordate at base, thinly pilose on both sides and ciliate-scabrous on the margins; sheaths lax, pilose along the margins. Spikes 7–15, solitary or in pairs along the main axis, spreading 1–3 cm. long, nearly sessile, pilose in the axils; rhachis flat, 2–3 mm. broad, scabrous on the inner face and margins, back smooth. Spikelets pale greenish-white, smooth, biseriate, appressed, obtuse, 2–2·3 mm. long; pedicels about 0·5 mm. long, pilose-scabrous on the outer side.

Wet meadows about Lake Patzcuaro. November 9.

No. 240 Rusby, 1886, from Bolivia, is the same.

According to Trinius (Panic. Gen., p. 78) *Paspalum gracile* Rudge, is an exceedingly variable species, differing much in its several forms in height of culm, length and breadth of leaves, number and length of spikes, pubescence, etc. He describes the spikelets as acute while in our plant they are obtuse. In other respects the characters agree very well. Our plant should be compared with *P. pallidum* HBK., which Trinius (l. c.) regarded as only a low growing variety of *P. gracile* Rudge. No. 1696 Fendler, from Venezuela, which was distributed as *P. pallidum* HBK. is rather *P. candidum* HBK.: note the uniseriate and obtuse spikelets, characters which Kunth specially points out as distinguishing *P. candidum* from *P. pallidum*. (HBK. Nov. Gen. et. Sp. I, p. 73).

**10.** (**3336**). **Panicum paspaloides** Pers., Pl. I, p. 81; Fourn. Mex. Pl. Enum., Gram., p. 18; Chapm. So. Fl., Suppl., p. 666; Vasey Bull. 8 (Bot. Div. U. S. Dept. Agr.) p. 23.

Shallow water of Lake Patzcuaro, State of Michoacan. October 22.

The Indians gather this grass to feed their donkeys, oxen, etc., by pulling out of the water the thick stems which are nearly six feet long (Pringle.)

11. (**3403**). **Panicum divaricatum** Linn. in. Elmgr. Pl. Jam. Pugil., No. 9; Fourn. Mex. Pl. Enum., Gram., p. 32; Chapm. So. Fl., p. 575; Vasey Bull. 8 (Bot. Div. U. S. Dept. Agr.) p. 39.

Very different from No. 1732, collection of 1888.

Ledges, Tamasopo Cañon. July 1.

12. (**3449**). **Panicum hians** Ell., var. **purpurascens** var. nov.

The three lower glumes dark purple. Branches of the panicle shorter, spikelets longer (nearly 3 mm.) and generally more crowded, and outer glumes more obtuse than in the species as found in the Southern States. Sparsely pilose near the base of the leaves, otherwise smooth throughout.

Wet hollows in prairies of Flor de Maria, State of Mexico. September 4.—*P. hians* Ell. is remarkable for the unusually large, subcoriaceous and obovate palea of the neutral floret.

13. (**3452**). **Panicum sulcatum** Aubl., Pl. Guian., I, p. 50; Griseb. Flor. Brit. West Ind., p. 547; Hemsl. Biol. Cent. Am., Botany, III, 496 (and p. 506 sub *Setaria*). *Setaria sulcata* Raddi var., Fourn. Mex. Pl. Enum., Gram., p. 42.

Wet shaded ledges, Tamasopo Cañon. September 30.

14. (**3320**). **Leersia hexandra** Sw., Prod. Fl. Ind. Occ., p. 21; Chapm. So. Fl., p. 549; Fourn. Mex. Pl. Enum., Gram., p. 2; *L. Mexicana* HBK., Nov. Gen. et. Sp., Pl. I, p. 195.

Shallow water, Lake Patzcuaro, State of Michoacan. October 25.

15. (**3274**). **Stipa tenuissima** Trin. (corresponds with Havard's Texan specimens so named by Dr. Vasey, Contbr. U. S. Herb. II, p. 55.)

Culms slender, simple, erect from a perennial root, 60–80 cm. high; leaves slender filiform, elongated, scabrous; ligule 2 mm. long; panicle 12–20 cm. long, slender, base enclosed in the upper leaf-sheath, branches in threes or fives, erect, 1–5 cm. long. Empty glumes with long-attenuated or subulate, hyaline and colorless tips, about 1 mm. broad at the purplish base, three-nerved, lateral nerves short; the first glume 6·5–8·5 mm. long, the second usually a little shorter; pedicels strongly scabrous. Flowering glume 2 mm. long, minutely tuberculate-roughened, crowned with a few short bristles and with a line of short appressed hairs on the back below; callus short and obtuse, pilose. Awn very slender 6–7 cm. long, minutely scabrous, strongly geniculate at about 2 mm. from the base, the long upper part flexuose. Palea rather delicate, less than one-half as long as its glume.

Carneras Pass, Coahuila, on limestone hills. September 20.

Neither Hemsley nor Fournier recognize *S. tenuissima* Trin. as Mexican. Among the species described by Fournier, *Stipa subulata* (Mex. Pl. Enum., Gram., p. 75) comes nearest to including our grass according to the characters that are given. Trinius (Act. Petrop. 1836, p. 36 and Stipac., p. 41) says of the South American plant, (the type was collected in Mendoza) "radix fibrosa, annua. Paniculæ angustissimæ teneræ, radiis subsolitariis." In our plant the root is evidently perennial and the rays of the panicle are in threes or fives; in all other respects, however, the excellent description given by Trinius for *S. tenuissima* applies most closely.

16. (3316). **Muhlenbergia Bourgæi** Fourn. Mex. Pl. Enum., Gram., p. 86. (Same as 1155 Bourgeau in herb. m.)

Annual. Culms much branched and leafy below, slender and naked above, 15–30 cm. high. Ligule acute, hyaline 3 mm. long. Leaves flat, 1–3 cm. long, 1 mm. or less broad, very finely scabrous on the margins and minutely pubescent on the upper side along the nerves. Panicle 3–5 cm. long, rather narrow, branches solitary, ascending, the lower ones 1·5–2·5 cm. long. Empty glumes unequal, the first lanceolate, acute, one-nerved, about 1·5 mm. long; the second much broader, 2 mm. long, three-nerved and acutely three-toothed at the apex. Flowering glume 3 mm. long, pilose below at the back and sides, scabrous above, awned just below the entire or bidentate apex; awn 8–12 mm. long, scabrous and strongly flexuose. Callus pilose.

Prairies of Flor de Maria. September 4.

In the closely allied *M. Clomena* Trin. (824 Pringle 1886, and 932 Parry and Palmer 1878), the culms are usually about 8–12 cm. high, the main axis of the short panicle and also its branches are strongly flexuose, at least at maturity. The second empty glume hardly 1·5 mm. long and scarcely exceeded by the flowering glume which is broader in proportion to its length and more pilose than in *M. Bourgæi.*

17. (3444). **Muhlenbergia Schaffneri** Fourn. var. **longiseta.** (*M. Schaffneri* Scribner, Bot. Gaz. IX, p. 187.)

Empty glumes scarcely one-half the length of flowering glume, awn 10–18 mm. long (2–3½ times longer than the glume). The apex of the flowering glume is often bifid, the divisions setiform; divisions 0·5–1·5 mm. long.

Foot hills of the Rio Hondo, ten miles west of the City of Mexico, growing on thin soil of ledges. August 25.

Fournier (Mex. Pl. Enum., Gram., p. 85) describing *M. Schaffneri* says, "glumis inæqualibus, inferiore profunde bidentata, brevior, superiore acuta æquante spiculam; palea inferiore integra, subulato-rostrata, seta æquante spiculam." These characters include my *M. depauperata* (Bot. Gaz. IX, 187), which, therefore, must be abandoned.

**18.** (**3477**). **Muhlenbergia articulata,** n. sp.

Perennial. Culms simple, erect, 60–80 cm. high, enveloped at the base, as are also the numerous innovations, by the old, persistent, and somewhat compressed leaf-sheaths which are terminated by the rigid ligules that project beyond the articulation where the fallen blades were attached. Leaves elongated, folded, terete, filiform, the upper one nearly equalling the panicle, smooth without, densely strigose-pubescent within, distinctly articulated with the sheath. Sheaths finely pubescent on the back above, at least when young, margins smooth, striate. Ligule rigid, 6–10 mm. long, entire, distinctly two-keeled, with broad, striate and decurrent margins, persistent on the old sheaths after the blades have fallen. Panicle pale-green or straw-colored, strict, elongated (30–40 cm.), rather densely flowered; branches numerous, short (2–4 cm.), erect. Spikelets lanceolate, subterete, erect on slender pilose-scabrous pedicels. Empty glumes lanceolate, acute, one-nerved, ciliate-scabrous on the nerves above, the second usually subulate-pointed and nearly as long as the floret, the first a little shorter and narrower. Flowering glume lanceolate, acute, 4–5 mm. long, three-nerved, slightly scabrous on the mid-nerve above and shortly pilose anteriorly on the distinct callus; awn strictly terminal, slender, subflexuose, 20–30 mm. long. Palea lanceolate, acute, about as long as the floral glume, two-nerved, nerves approximate, especially near the tip where they are slightly scabrous, smooth below.

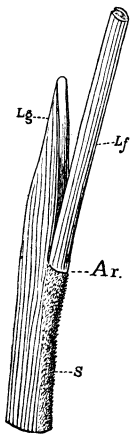



Fig 1. *Muhlenbergia articulata.* S, Upper portion of leaf-sheath; Lg, Ligule; Lf, lower portion of the lamina; Ar, point of articulation of lamina with the sheath.

Calcareous banks, Cardenas, State of San Luis Potosi. October 7.

**19.** (**3381**). **Perieilema crinitum** Presl, in Rel. Hænk. I, 233, t. 37; Kunth Enum. Pl. I, p. 235; Fourn. Mex. Pl. Enum., Gram., p. 93.

Spikelets one-flowered, the ♀ surrounded at the base with numerous bristles or delicate bracts and a few ♂ spikelets. Flowering glume

three-nerved, pilose at the base, long awned; nerves of the palea almost coalescing above.

A slender, branched annual 20–80 cm. high, often rooting at the lower joints; leaves long and delicate; spikelets crowded in dense clusters forming a more or less interrupted spike-like panicle, 8–20 cm. long.

Shaded ledges of a barranca, near Guadalajara, State of Jalisco. October and November.

**20.** (**3317**). **Sporobolus repens** Presl, Rel. Hænk. I, 241. *Vilfa repens* Trin. Agrost. I, p. 80; Fourn. Mex. Pl. Enum., Gram., 101. Same as 3285. Borgeau.

Shallow ponds (then sterile and the stems and leaves floating on the surface of the water), and in wet soil about the borders of these (then rooting and fruiting), prairies of Flor de Maria, State of Mexico. September 4.

**21.** (**3197**). **Sporobolus argutus** Kunth, Enum. Pl. I, p. 215; *Vilfa argutus* Nees, Agrost. Bras. 395; Trin. Agrost. I, p. 40; *Vilfa humifusa* HBK. var. B major, Fourn. Mex. Pl. Enum., Gram., p. 97. Same as 816 Pringle, 1886.

Low meadows, Valley of Mexico, Federal District. July 27.

**22.** (**3130.**) **Sporobolus minutiflorus** Link ?; Kunth, Enum. Pl. I, p. 214. *Vilfa minutiflora* Trin. Agrost. I, p. 63; Doell Flor. Brs. fasc. LXXIX, p. 31.

Culms 20-40 cm. high, slender. Leaves flat, 3 mm. or less broad, 3–10 cm. long. Ligule very short, ciliate. Panicle exserted, pyramidal, 8–16 cm. long; branches solitary or (rarely) in pairs, the lower ones 4–6 cm. long, naked below; spikelets rather crowded above and along the secondary branches on short unequal pedicels. Spikelets 1 mm. long; second glume about 0·5 mm. long, rounded, obtuse, broader and a little longer than the first; flowering glume and palea equal, obtuse and nerveless.

Thin soil of limestone ledges, hills above Las Canoas, State of San Luis Potosi.

**23.** (**3335**). **Epicampes Bourgæi** Fourn. ? (Mex. Pl. Enum., Gram., p. 88); *Sporobolus complanatus* Scribner, as distributed.

Perennial. Culms rather stout, simple, erect, 1·5 mm. high, compressed below, smooth, nodes pruinose. Leaves with smooth carinate sheaths longer than the internodes; ligule delicate, hyaline, 10 mm. long, acute or lacerated; lamina elongated (60 cm.) attenuate-pointed, flat, 3–6 mm. wide, scabrous on both sides and rough-serrulate along the margins. Panicle diffuse, 45 cm. long; branches irregularly scattered along the main rachis, capillary, naked below

for one-half their length, the lower widely spreading, 10–15 cm. long, shorter and more erect above. Spikelets not at all compressed, 1·5–2 mm. long, one-flowered. Empty glumes ovate or oblong, obtuse, subequal, distinctly one-nerved, minutely roughened on the back, equalling or a little shorter than the floret. Flowering glume distinctly three-nerved, rather broadly obtuse, occasionally short-mucronate pointed by the extension of the mid-nerve, smooth at the base. Palea as long as its glume, two-nerved, embracing (not adherent to) the caryopsis in fruit. Stamens three. Stigmas projecting from the sides of the floret. Fruit a caryopsis, smooth, subterete, obtuse, nearly as long as the fruiting glume and loosely held in the floret by the broad margins of the palea. (Pl. XIII, figs. 4–4d).

Under cool cliffs of a barranca, near Guadalajara, State of Jalisco. November 3.

This grass differs from *Epicampes* as described by Bentham and Hooker (Gen. III, p. 1148) in its widely diffuse panicle which, with its small spikelets, resembles an *Agrostis*. The irregular (spiral ?) disposition of the branches, the firm texture of the flowering glume, large palea and terminal awn or mucro, separate it from that genus. The strictly adherent pericarp alone separates it from *Sporobolus*. From *Muhlenbergia* it is distinguished by its loosely enclosed caryopsis, this being held chiefly by the palea, to which however, it is not at all adherent. As understood by Fournier, the grass in question certainly belongs to *Epicampes*, and it is probably his *E. Bourgœi*. From his imperfect descriptions, however, one is hardly enabled to positively determine the species. Unfortunately I am not able to compare Pringle's specimens with those of Bourgeau and Liebman, referred to by Fournier as types of his *E. Bourgœi* and *E. expansa*.

**24. (3445). Deschampsia Pringlei**, Scribn. (in Pringle's coll., 1887, no. 1429.)

Culms slender, erect, very smooth, 60–70 cm. high. Sterile shoots (innovations) numerous, extravaginal, leaves of these rather short and narrower than those of the flowering culm. Sheaths smooth, shorter than the internodes. Ligule membranous, about 2 mm. long, obtuse, broader than the leaf-blade. Leaves flat, 5–12 cm. long, 1–3 mm. (usually about 2) wide, scabrous above and along the margins, somewhat rigid at the involute apex. Panicle 7–12 cm. long, strict, densely flowered, somewhat interrupted below; branches erect, appressed, the longer ones 2–3 cm., covering the internodes of the

main rhachis. Spikelets 2-flowered with a minute prolongation of the rachilla behind the second floret, on short (usually very short) scabrous pedicels; empty glumes longer than the florets, subequal, about 5 mm. long, lanceolate, acute, one-nerved, or the second, which is a little broader than the first, indistinctly three-nerved below, scabrous along the keels to near the base, margins broadly scarious; flowering glumes oblong, rounded on the back, texture rather firm below, faintly five-nerved (nerves visible only by transmitted light) two-lobed at the apex, lobes scarious, rounded and minutely erose dentate; callus short, subacute, pilose with short stiff hairs; internode between the florets very short, awn from near the base of the flowering glumes, 6–7 mm. long, geniculate, twisted below; palea $\frac{2}{3}$ as long as the glume, delicate. (Pl. XIII, figs. 1, 1a).

Damp soil of plains, La Honda, State of Zacatecas. August 19.

The type (No. 1429, 1887) was found growing in wet places, pine plains, at the base of the Sierra Madre in the State of Chihuahua. The plant from La Honda has rather narrower glumes, both empty and flowering, the latter nearly equalling the former in length, and the prolongation of the rachilla above the second floret is more conspicuous.

**25. (3279). Danthonia Mexicana** sp. nov.

Culms 70–90 cm. high, erect, slender, wiry. Leaves strongly involute, erect, rather rigid, pungent, scabrous without, strigose-pubescent within; ligule 2–3 mm. long, laciniate, auricled. Panicle strict, 15–20 cm. long; branches solitary or in pairs bearing 1–3 spikelets, slightly pilose in the axils. Spikelets about 15 mm. long, 3–4 flowered; empty glumes lanceolate, very acute or mucronate-pointed, 7–9 nerved, slightly unequal, the first about 12 mm. long, the second a little broader and longer, scarious-margined; flowering glumes rounded on the back, pilose with silky hairs on the lower half, bifid at the apex the divisions subulate-pointed, 9-nerved, the three middle nerves approximate and extending into the geniculate awn which is about 14 mm. long, flat and twisted below; callus subacute, densely pilose; palea narrow, about 7 mm. long, ciliate-scabrous on the nerves above. Ovary about 3 mm. long with a pubescent, cushion-like summit. (Pl. XIII, figs. 7–7*b*).

Very unlike any other North American species.

Dry limestone ledges, Carneros Pass. September 20.

26. (**3465**). **Microchloa setacea** R. Br., Prod. Flor. Nov. Hol., p. 286; Benth. Flor. Austr. VII, p. 608; HBK. Nov. Gen. et. Sp. I, p. 84, t. 22; Doell in Mart. Flor. Bras. II, 3, p. 75, t. 21; S. Wats. in Proc. Am. Acad. XVIII, p. 176.

Spikelets 2–2·5 mm. long, acute, strictly one-flowered, awnless, sessile and closely imbricate along one side of the rachis forming a slender terminal, more or less falcate spike 3–8 cm. long. Empty glumes nearly equal, persistent, one-nerved. Flowering glumes shorter, hyaline, three-nerved, and somewhat irregularly three-toothed at the broad apex, lateral nerves nearly marginal, ciliate on the back below and on the margins (with longer hairs) to the summit.

An annual with slender, densely tufted culms, 8–20 cm. high.

Sandy soil, Valley of Mexico. July 27.

27. (**3451**). **Spartina densiflora** Brongn. in Dupr. It. Bot., p. 14; E. Desv. in C. Gay Fl. Chil. VI, p. 372. (From description.)

Allied to *S. gracilis* Trin., but quite distinct.

Brackish marshes, Las Tablas. July 8.

*Spartina Gouini* Fourn. is apparently the same; the characters given for this species (Mex. Pl. Enum., Gram., p. 135) certainly embrace our plant.

28. (**3174**). **Bouteloua stolonifera**, *B. scorpioides* Lag.? S. Wats. in Proc. Am. XVIII, p. 176. Same as 1010 Schaffner.

Plants strongly stoloniferous. Spikes readily deciduous as a whole. Spikelets distinctly pedicellate. Callus of the ♀ floret shortly pilose, and near the middle of the pedicel of the long-awned (10–15 mm.) upper empty glumes there is a minute tuft of short hairs, glumes otherwise smooth.

Plains, State of Zacatecas, between San Luis Potosi and Aguas Calientes. August 19.

Fournier refers Lagasca's plant (*B. scorpioides* Lag.) to *Chondrosium tenue* Beauv. (*B. tenuis* S. Wats.) but it is quite impossible to identify *B. scorpioides* by the meager description—"*culmo erecto, filiformi, monostachyo; spica lineari-oblonga, spiraliter revoluta*"—given by Lagasca. So far as they go, however, these characters are rather more applicable to *B. tenuis* than to 3174 Pringle or 1010 Schaffner.

29. (**3252**). **Leptochloa Mexicana** sp. nov.

Culms simple, terete, solid, erect, 1 m. or more high from a strong creeping root-stock. Sheaths longer than the internodes. Ligule a ring of stiff hairs, 2–3 mm. long. Leaf-blade flat, 30–40

cm. long, lanceolate, 1–2 cm. broad, tapering gradually to the very acute tip, glabrous; mid-rib white and prominent below, evanescent above. Panicle pyramidal, 30–40 cm. long with a strong, sulcate-angular and smooth rachis; branches simple, rather slender, ascending, solitary or the lower subverticillate, triquetrous, scabrous on the angles, the lower 20–27 cm. long, becoming shorter above. Spikelets 10–14 mm. long, 3–4-flowered, erect and *racemose along the outer side of the branches*, remote below, approximate above; pedicels mostly shorter than the spikelets; empty glumes membranaceo-chartaceous, broadly lanceolate, acute, one-nerved, unequal, the first 4–5 the second 6–7 mm. long, scabrous on the nerve; flowering glume 3-nerved, nerves densely silky-villous for one-half or two-thirds their length from the base, mid-nerve extending into a short awn beyond the acute and *entire* apex, the nearly marginal lateral nerves evanescent above. Palea two-toothed, pilose on the nerves below, finely scabrous above. Callus densely pilose. Joints of the rachilla about 2 mm. long, pubescent above. Stamens three. Stigmas plumose, projecting from the sides of the florets. Ovary smooth.

A tall reed-like, perennial grass with solid culms which are somewhat frutescent below, broad flat leaves and ample panicle.

About dry ledges, Tamasopo Cañon. September 28.

This grass might be classed as *Diplachne* if compared with the American species referred to that genus by Bentham, rather than with the characters which he has assigned to it. In defining the genus *Diplachne* both Bentham and Hackel describe the flowering glume as one-nerved. *Molinia serotina* (*Festuca serotina* L.), referred to *Diplachne* by Bentham (Gen. Pl. III, p. 1176), has 5-nerved flowering glumes; all the American species which the same author refers to this genus have the flowering glumes distinctly three-nerved. These American species clearly possess the peculiar inflorescence which alone serves to distinguish the Chlorideæ from the Festuceæ. To me the genus *Diplachne* is not only poorly established, but really stands in the way of a simple and natural classification, and all attempts to maintain it are most likely to result in confusion. As already stated, the North American species which have recently been referred to or placed in *Diplachne* belong, by their inflorescence, to the Chlorideæ and ought to be referred to *Leptochloa*. Beauvois' genus, *Diplachne* (Agrost., p. 80, t. XVI, f. 9) was founded upon *Leptochloa fascicularis* Gray. Beauvois says nothing of the nervation of the flowering glumes; these are, however, distinctly

three-nerved; nor does he mention the disposition of the spikelets, but they are manifestly arranged along one side of the branches of the simple panicle. Adding these characters to his description there is nothing left to distinguish *Diplachne* from *Rabdochloa* Beauv. (Agrost., p. 84, t. XVII, f. 3) which Bentham has very properly referred (Gen. Pl. III, p. 1173) to *Leptochloa*. *Leptochloa spicata* (*Diplachne spicata* Dœll) connects *Leptochloa* on the one side with *Microchloa*, from which it differs by its less crowded and several flowered spikelets, and on the other side with *Triodia*, from which it is separated by its one-sided inflorescence and more distinctly keeled flowering glumes; from the recognized species of *Leptochloa* it differs only in its more simple inflorescence. *Leptochloa rigida* Munro (*Diplachne rigida* Vasey) is an *Eragrostis* (*E. rigida Scribn.*)

30. (**3448**). **Leptochloa dubia** Nees, Agrost. Bras., p. 433; Chapm. So. Flor., p. 559; *Diplachne dubia* Benth. ex. S. Wats. Proc. Am. Acad. XVIII, p. 181; Vasey Grasses U. S., p. 35.

Cardenas, State of San Luis Potosi. October 7.

31. (**3267**). **Leptochloa spicata.**—*Diplachne spicata* Doell on Mart. Fl. Bras. II, 3, t. 28; Benth. Notes on Gram. Trans. Linn. Socy. XIX, p. 111; *D. Reverchoni* Vasey, Bull. Torr. Bot. Club, XIII, p. 118; *Triodia Schaffneri* S. Wats., Proc. Am. Acad. XVIII, p. 181; *Triplasis setacea* Griseb., ex Benth. l. c., et Gen. Pl. III, p. 1177.

Hills near San Luis Potosi. September 7.

32. (**3284**). **Eragrostis pectinacea** Steud., Syn. Gram., p. 272; Gray Man. Bot. 5 ed., p. 632; Fourn. Mex. Pl. Enum., Gram., p. 114.

Cardenas, State of San Luis Potosi. October 7.

33. (**3472**). **Eragrostis ciliaris** Link, Hort. Berol. I, p. 192; Chapm. Flor. So. U. S., p. 536.

Las Palmas, State of San Luis Potosi. June 5.

34. (**3334**). **Eragrostis Vahlii** Nees, Agrost. Bras., 499; Doell in Mart. Flor. Bras. II, 3, p. 154; *amœna* Presl, Rel. Hœnk. I, p. 275, ex Kunth Enum. I, p. 342 (sub. Poa); *Megastachya amœna* Fourn. Mex. Pl. Enum., Gram., p. 118. *Eragrostis Pringlei* Scribn. as distributed.

Annual. Culms cæspitose, erect or ascending, 5–30 cm. high, simple or with flower-bearing branches below. Leaves flat, attenuate-acuminate, smooth on the upper surface, usually pilose; sheaths slightly compressed, striate, pilose at the throat. Panicle short (3–5 cm.) and subspicate, or elongated (10–15 cm.) with the solitary lower branches remote and more or less spreading, spikelet bearing to the base, axils pilose. Spikelets very short-pedicellate, crowded or fasciculate, erect or somewhat spreading, 5–25 mm. long, linear or linear-oblong, much compressed, many (10–50) flowered.

Empty glumes lanceolate-acuminate or acute, subequal, a little shorter than or nearly equalling the adjacent floral glumes, one-nerved, scabrous on the keel. Flowering glume 2—2·5 mm. long, ovate-lanceolate, strongly acuminate-pointed, distinctly three-nerved, scabrous on the keel above. Palea ⅓ shorter than its glume, finely ciliate along the keels. (Pl. XIII, figs. 8, 8a.)

Sandy plains, near Guadalajara, State of Jalisco. October and November.

35. (**3243**). **Briza subaristata** Lam. I, 187; Doell in Mart. Flor. Bras. II, 3, p. 134. *Chascolytrum subaristratum* Desv. in Journ. de Bot. III, p. 71; Kunth. Revis. Gram. I, p. 347, t. 87; *Briza rotundata* Steud. Gram., p. 284; S. Wats. in Proc. Am. Acad. XVIII, p. 182; Hemsl. in Biol. Cent. Amer. III, p. 579.

Perennial. Culms rather slender, 40–60 cm. high, erect or slightly geniculate at the lowermost joints. Panicle narrow, 6–10 cm. long, branches and spikelets erect. Spikelets thick, ovate or subrotund, 3–5 mm. long, 6–10 flowered. Empty glumes cymbæform, nearly equal, shorter than the first florets, scabrous above, the first three-nerved, the second seven-nerved, much broader and subcordate at base. Flowering glumes nearly as broad as long (3–3·5 mm.) deeply cordate at the base; very abruptly short-acuminate (*rostrato-apiculatæ*) the apex minutely two-toothed with a short awn or mucro between the teeth, strongly convex on the back below, this portion being coriaceous, shining and very often minutely pubescent, the broad, flat margins whitish or purplish (*B. violescens* Steud.?). Palea roundish-oblong, exactly covering the inflated portion of the flowering glume. (See Pl. XIII, figs. 10–10d.)

Calcareous bluffs, Flor de Maria and Rio Hondo. August and September.

36. (**3443**). **Brachypodium pinnatum** Beauv. var. **cæspitosus**.

Culms cæspitose, slender, somewhat geniculate and more or less branched below, 50–80 cm. high; nodes closely and downwardly pubescent; sheaths slightly scabrous, the overlapping edge conspicuously ciliate, the lower sheaths occasionally sparingly pilose; ligule 1–1·5 mm. long, fimbriate, broader than the leaf-blade; lamina flat, 2–4 mm. wide, very acute, scabrous, pilose with scattered hairs on the upper surface; raceme 6–8 cm. long, bearing 4–6 spikelets on short (2 mm.) and finely pubescent pedicels; spikelets erect or spreading, 2–2·5 cm. long, 6–9-flowered; first glume 6 mm. long, 5-nerved, the second a little broader and longer (7–7·5 mm.),

7–9-nerved, both very finely serrate on the scarious margins near the rather blunt or subacute tips; first flowering glume about 9 mm. long, 7-nerved, rounded on the back and terminating in a short (3–6 mm.) awn; palea strongly 2-nerved, 2-keeled, ciliate on the keels above. Ovary crowned with a thickened, villous appendage which extends down the sides to the base. Caryopsis broadly sulcate, adherent to the palea which it nearly equals in length, crowned with the remains of the villous appendage of the ovary. Embryo small. Lodicules conspicuous, obliquely pointed with ciliate margins. (See Plate XIII, figs. 5–5e.)

Wet meadows about Lake Patzcuaro. November 9.

This grass comes too near the European *B. pinnatum* (as represented in my herbarium) to be separated from it specifically; it is, however, rather more distinctly cæspitose in habit, and in my specimens there is no evidence of a creeping rootstalk, the presence of which is given as one of the characters of the species.

*II. Species collected in* 1890, *by the Expedition from the Academy of Natural Sciences of Philadelphia, under Prof. A. Heilprin.*

1. (**172**). **Andropogon saccharoides** Sw. Prod. Flor. Ind. Occ., p. 26; Flor. Ind. Occ. I, p. 205.

Near the City of Mexico, Mexico. April 11, 1890.

2. (**67**). **Ægopogon geminiflorus** HBK., Nov. Gen. et Sp. Pl. I, p. 133, t. 43; Fourn. Mex. Pl. Enum., Gram., p. 71.

Dry rocky places, Town of Orizaba, Mexico. March 28, 1890.

3. (**274**). **Chloris ciliata** Sw., Flor. Ind. Occ. I, p. 197; Doell in Mart. Flor. Bras. II, 3, p. 66; Kunth Enum., Pl. I, p. 263; Trin. Icon. Gram., t. 307.

Calcehtoh, Yucatan. March 11, 1890.

4. (**184**). **Bouteloua Americana** Scribn.
*Aristida Americana* Sw., Obs. 41, t., f. 2 (1791) ex Kunth.
*Dinebra Americana* Beauv., Agrost., p. 98, t. XVI, f. 3 (1812.)
*Dinebra repens* HBK.! Nov. Gen. I, 172, t. 52 (1815.)
*Atheropogon repens* R. & S., Syst. Veg. II, p. 416 (1817.)
*Bouteloua bromoides* Lag., Elench., p. 5 (1815) ex S. Wats. Proc. Am. Acad. XVIII, pp. 177 et 179.
*B. litigiosa* Lag. (according to specimen in my herbarium from Porto Rico, so named by Hackel.)
*B. Humboldtiana* Griseb. Pl. Wr., p. 132, excl. Syn.

NOTE. *Aristida Americana* L., cited by Kunth (Enum. Pl., p. 281) as a synonym of his *Eutriana juncifolia*, is a true Aristida which Trinius named *A. dispersa*, according to Munro in his enumeration of the grasses in the Linnæan herbarium. Dr. Watson (l. c.) united under *Bouteloua bromoides* Lag., *Heterostega juncifolia* Desv.

in Bull. Soc. Phil. Dec. (1810), and *Bouteloua Humboldtiana* Griseb. Tekanto, Yucatan, February 28, 1890.

**5. (210). Bouteloua Triæna** Scribn.

*Triæna racemosa* HBK., Nov. Gen. et Sp. I, p. 179, t. 61. Kunth. Enum. Pl. I, p. 284. *Atheropogon Triæna* Spreng., Syst. I, p. 293, ex Kunth; *Bouteloua Triathera* Benth. Journ. Linn. Soc. XIX, p. 104 (in part.)

Culms slender, branched at the base. Leaves flat, sparingly pilose, at least the lower ones, as are also the sheaths; ligule a ring of dense short hairs. Spikes distichously-racemose along the upper part of the culm from which they readily fall at maturity, partial rachis continued beyond the solitary spikelet into a bristle-like prolongation lying close to the lower glume which it nearly equals in length. Empty glumes narrowly oblong, one-nerved, somewhat inequilateral and slightly retuse at the blunt point, the first about 2 mm. long, the second about 3·5 mm. long. Flowering glume 3-nerved, 5–6 mm. long, slender-acuminate-pointed, scabrous on the keel above, and sometimes with a few short scattered hairs on the back (seen under the lens). Palea nearly as long as its glume, entire or bimucronate at the narrow tip. Second floret reduced to three scabrous, nearly equal awns (about 8 mm. long) supported on a smooth joint of the rachilla (stipe) which is about one-half as long as the floral glume.

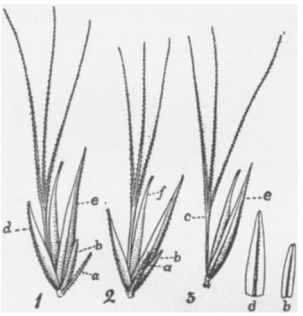



Fig. 2.
*Bouteloua Triæna*, 1 and 2, entire spikelets; 3, spikelet with empty glumes removed; a, continuation of the partial rachis supporting the spikelet; b, first empty glume; d, second empty glume; e, flowering glume; f, palea; c, the 3-awned rudiment. (Original).

It is doubtless the prolongation of the partial rachis which is often so closely appressed to the back of the lowest glume that Kunth mistook it for a basal awn ("glumæ 2; inferior basi aristata," Enum. Pl. I, p. 284, et HBK. Nov. Gen. et Spec. I, p. 179, t. 61, f. 1).

Our plant differs too much from the description of *Triathera Americana* Desv. (included in *Bouteloua Triathera* by Bentham) to be classed specifically with it. In that the culms are very much branched with rigid involute-sectaceous leaves; the empty glumes are ovate-lanceolate, subulate acuminate and the apex of the flowering glume is trifid with subulate divisions.

In our specimens, the culms are less branched, the spikelets nearer the main axis (more nearly sessile as understood by Kunth)

than in *Triæna racemosa* as figured by Kunth, and the glumes are more unequal.

Tekanto, Yucatan. February 22, 1890.

6. (170). **Eragrostis lugens** Nees, Agrost. Bras. 505; Doell in part. Flor. Bras. II, 3, p. 140.

Near *Eragrostis capillaris* Steud. (*Poa capillaris* Linn.)

San Angelo, near the City of Mexico, Mexico. April 11, 1890.

7. (187). **Eragrostis ciliaris** Link, Hort. Berol. I, p. 192; Griseb. Flor. Brit. W. Ind., p. 532; Chapm. Flor. So. U. S., p. 563. *Poa ciliaris* Linn. in Elmg., Pl. Jam. Pug., p. 13; Sp. Pl. ed. 2, p. 102.

Tekanto, Yucatan. February 27, 1890.

8. (169). **Bromus unioloides** HBK. Nov. Gen. et Sp. I, p. 151; Doell in Mart. Flor. Bras. II, 3, p. 110.

Near the City of Mexico, Mexico. April 11, 1890.

9. (168). **Hordeum jubatum** Linn., Sp. Pl. ed. I, p. 85; A. Gray, Man. Bot. North. U. S. ed. 6, (1890) p. 672.

Near the City of Mexico, Mexico. April 11, 1890.

## Explanation of Plate XIII.

Fig. 1. A spikelet of *Deschampsia Pringlei.*

Fig. 1a. The same with the empty glumes removed.

Fig. 2. A group of spikelets of *Hilaria cenchroides* var. *ciliata,* anterior view.

Fig. 2a. Posterior view of the same.

Fig. 2b. A group of spikelets of *Hilaria cenchroides* from no. 493, Pringle, 1885 coll.

Fig. 3, 3a; 3b. Spikelets of *Panicum hians* Ell., var. *purpurascens,* three views.

Fig. 3c. Palea of the neutral floret of same.

Fig. 3d. Dorsal view of the ☿ floret of same.

Fig. 4. A spikelet of *Epicampes Bourgæi* (?).

Fig. 4a. Empty glumes of the same.

Fig. 4b. A dorsal view of the flowering glume of the same.

Fig. 4c. Anterior view of floret of same, showing the palea.

Fig. 4d. Caryopsis of same.

Fig. 5. Empty glume of *Brachypodium pinnatum* var. *cæspitosum.*

Fig. 5a. Dorsal view of the flowering glume of the same.

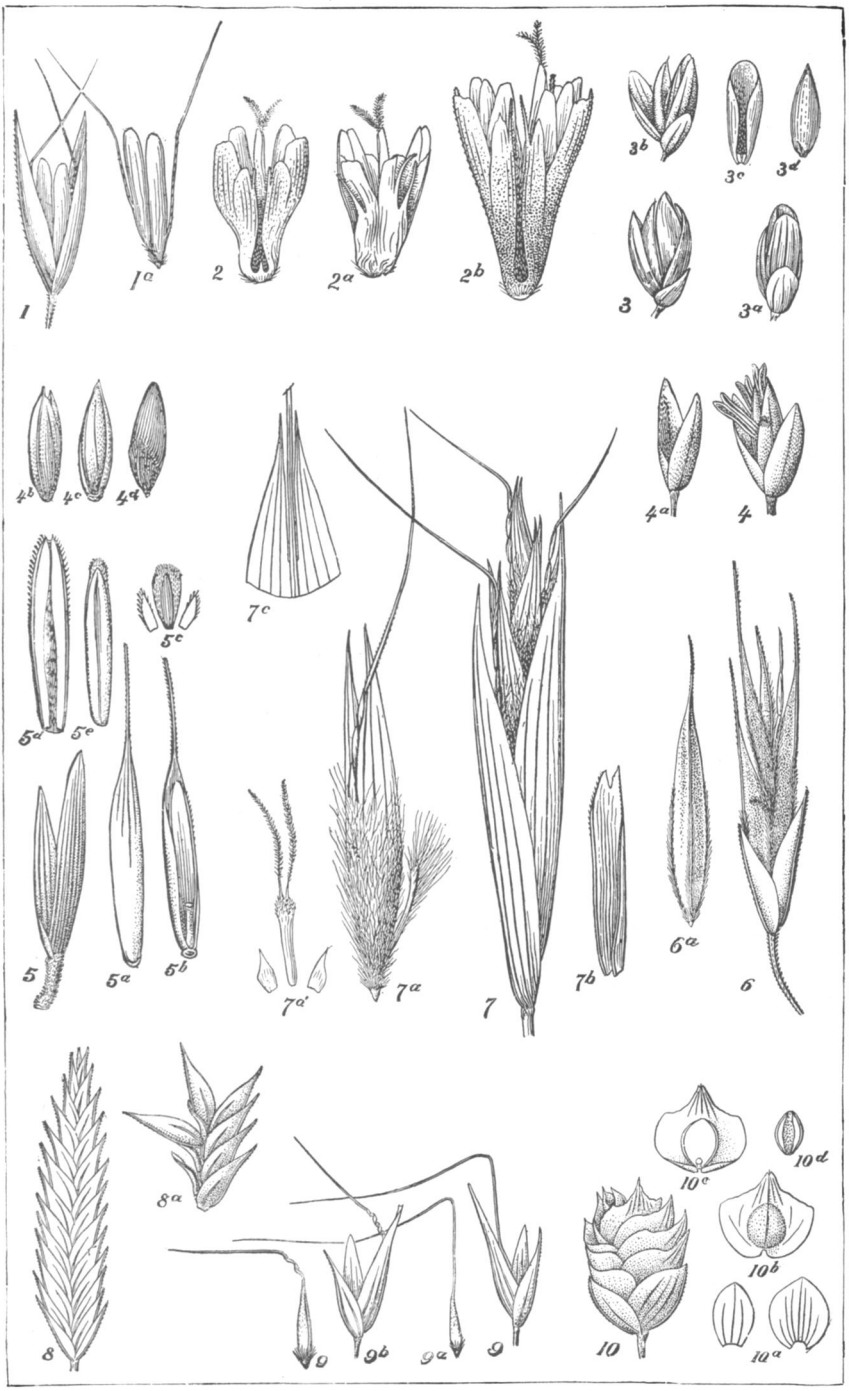
Fig. 5b. Anterior view of floret of same showing the palea and joint of rachilla.

Fig. 5c. Ovary and lodicules of same.

Fig. 5d. Palea of same.

Fig. 5e. Caryopsis of same.
Fig. 6. Spikelet of *Leptochloa Mexicana.*
Fig. 6a. Dorsal view of the flowering glume of same.
Fig. 7. Spikelet of *Danthonia Mexicana.*
Fig. 7a. A single floret from the same showing a joint of the rachilla to the right.
Fig. 7b. Palea of the same.
Fig. 7c. Apex of the flowering glume of same with a portion of the awn.
Fig. 7d. Pistil and lodicules of same.
Fig. 8. Spikelet of *Eragrostis Vahlii.*
Fig. 8a. A portion of same showing persistent paleas.
Fig. 9. A spikelet of *Arundinella Deppeana.*
Fig. 9a. The awned floret of same.
Fig. 9b. A spikelet of *Arundinella Brasiliensis* (?) from no. 1746, Pringle, 1888.
Fig. 9. Awned floret from the same, figure to the left of 9*b*.
Fig. 10. A spikelet of *Briza subaristata.*
Fig. 10a. The empty glumes of same.
Fig. 10b. Dorsal view of the flowering glume of same.
Fig. 10c. Anterior view of the flowering glume of same with palea.
Fig. 10d. Anterior view of palea of same.

NOTE. All figures original and drawn by the author from specimens collected by Pringle.




SCRIBNER, MEXICAN GRASSES,